



Syllabus: BIO 254N Global Change Biology

Course Information

Course Title: Global Change Biology

Course Prefix/Number: BIO 254N-1

Semester: Fall 2020

Class Days/Times: Tuesdays & Thursdays 2PM-4:45PM

Credit Hours: 4 (lecture and lab are integrated)

Delivery: Synchronous Zoom Meetings

Prerequisites: Assessment or completion of WRT 101; Completion of BIO 105N or signature of instructor

Instructor Information

Name: Kimberly Danny

Phone/Voice Mail: 928-380-5536

E-mail: kdanny@tocc.edu

Office location: Ha-Maşcamdam Ha-Ki: Room 121

Office hours: Monday through Thursday 12PM-1:15PM and by appointment

Course Description

Global change biology is a new field of biology which explores the consequences of global environmental change on humans and ecosystems. This course focuses on climate change as a key driver of environmental change. Climate change is addressed by exploring causes of past and current climate change while providing a strong contextual setting for Native American students based on their own culture and traditional ecological knowledge. Impacts of climate change on humans and ecosystems are covered from a holistic and interdisciplinary perspective with an emphasis on understanding the interconnectedness of biotic and physical systems. Students will learn about and compare traditional knowledge with western science understanding of climate processes and effects. This course will explore mitigation and adaptation strategies for climate change impacts and will include an opportunity for students to develop ideas on how Native American nations can respond to a future of changing climate.

Student Learning Outcomes

After completion of the course students will be able to ...

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1. Apply basic concepts of meteorology, climatology and traditional ecological knowledge to describe and understand their local climate and environment.
2. Summarize how the earth's climate system works and understand the physical processes and dynamic interactions of the biosphere, atmosphere, oceans, ice and land surface.
3. Describe changes in climate through time and be able to distinguish between long term geologic-scale climate change and recent human-caused climate change.
4. Explain how future climate changes are predicted, both globally and for their own region or tribal lands, and how scientists make predictions about future climate scenarios.
5. Discuss current impacts of climate change on humans and ecosystems as well as future predicted impacts.
6. Describe various approaches to collecting and analyzing data, including field data collection, visual data analysis, and using data to understand trends or discover underlying issues.
7. Apply scientific and traditional ecological knowledge toward positive solutions to the impacts of climate change while respecting tribal values and strengthening community ties.

Course Structure

This course consists of four parts each consisting of a varying number of modules (see *Himdag* cultural component below). Each module consists of PowerPoint lectures, assigned reading, and a quiz. Each module also contains some combination of, but not all of the following: documentaries, in-class activities, in class and online discussions, laboratory exercises, reflective writing and homework assignments.

It is important that stay on top of the readings, videos, and assignments. If you do experience any hardships, please let me know right away so we can come up with a solution.

Synchronous (Live) Zoom Sessions. Learners are required to read/watch/listen to introductory materials before live Zoom classes and be actively engaged. Please expect a brief lecture, small-group discussions, and ask/answer questions. I intend to limit live sessions to 1.5 hours, because I understand how draining it is to be online all day. However, I will remain online for the duration of the class times listed to answer any questions or provide clarification.

Asynchronous Tasks and Assignments. Outside of the Zoom sessions, learners will be expected to watch micro-lecture videos, take notes, submit a copy of your notes, participate in asynchronous discussions, submit written assignments, and complete laboratory activities.

Quizzes. Four (4) quizzes will be proctored at the end of each unit.

Projects. There are two final projects for this class: an individual written project and a collaborative group project. The individual final project for the course is a Climate Change Controversy Report in which students choose a current controversial topic related to climate

change and explore each side of the issue. The objectives of this Controversy Report are 1) to synthesize, apply, and add to course content by critically analyzing a current environmental issue related to climate change 2) to examine multiple perspectives and facets of a climate change issue by gathering information from a variety of sources, assessing the scientific credibility of the information, and determining the special interests (the players) involved and 3) to arrive at a personal opinion based on a well-researched, well-thought-out rationale.

The group final project is the development of a Community-based Climate Change Adaptation Plan for our region. The Adaptation will integrate local traditional knowledge with scientific knowledge.

Course Learning Materials and Textbook Information

Required Textbook

Daniel R. Wildcat. 2009. *Red Alert! Saving the Planet with Indigenous Knowledge*. Golden, Colorado: Fulcrum Publishing.

Other supplemental materials can be accessed through Canvas or the internet.

Courses Outline and Important Dates

Course Outline

- I. Introduction to Climate
 - A. Climate Terminology & Fundamentals
 - B. Native American Creation Stories
 - C. Climate and Ecosystems of Native American Tribes
- II. The Earth's Climate System
 - A. Energy
 - B. Atmosphere
 - C. Land – Biomes
 - D. Ocean - Overview
 - E. Hydrologic Cycle
 - F. Carbon cycle
- III. Intro to Climate Change and Global Warming
 - A. Long-term changes in climate
 - B. Short-term climate cycles
 - C. Greenhouse Effect
 - D. Sources of Greenhouse gasses
- IV. Impacts on Humans and Terrestrial Ecosystems
 - A. Loss of Biodiversity
 - B. Changes in Seasons and Phenology
 - C. Changes in animal diversity and distribution
 - D. Impacts on Western Forests
 - E. Impacts on the Arctic

- F. Impacts to Human Health
- V. Impacts on Water Resources and Aquatic Ecosystems)
 - A. Water in the Arid Southwest
 - B. Snow, ice and glaciers
 - C. Oceans and rising sea level
 - D. Ocean, streams and salmon
- VI. Sustainability, Mitigation and Adaptation
 - A. Renewable Energy
 - B. Climate Change Legislation
 - C. Social Change and Transformation

Evaluations and Grading & Assignments:

GRADE	PERCENTAGE (%)
A	90-100
B	80-89.9
C	70-79.9
D	60-69.9
F	0-59.9

Your grade will be determined by the following:

EVALUATION	NUMBER OF ASSIGNMENTS	POINTS PER ASSIGNMENT	WEIGHTED GRADE %
Class Participation	15	100	10%
Weekly Discussion Boards	11	100	15%
Written Assignments	10	100	15%
Lab Activities/Reports	5	100	15%
Research Projects	2	100	25%
Exams	3	100	20%
TOTAL			100%

Himdag Cultural Component

Tohono O'odham traditions and cultural beliefs will be discussed as relevant course topics, and only as appropriate to the Tohono O'odham Nation's traditional standards for sharing information as determined by the *Himdag* committee.

Policies and Expectations

Attendance Policy

You are expected to arrive to class on time and be prepared to participate in each class period. Four unexcused absences may result in withdrawal and a "W" or "Y" will be recorded. You may request to be excused from class for religious observances and practices, for illness, for school or work-related travel or for personal or family emergency. If you will be absent, please notify the instructor as soon as possible (approved by Faculty Senate April 2014).

Incomplete Policy

Incomplete (I) grades are not awarded automatically. The student must request an "I" from the instructor who can choose to award an Incomplete only if all three of the following conditions are met:

1. The student must be in compliance with the attendance policy.
2. The student must have unavoidable circumstance that would prohibit the student from completing the course.
3. The student must have completed over 75% of the course requirements with at least a "C" grade.

Incompletes are not a substitute for incomplete work due to frequent absences or poor academic performance. Incomplete grades that are not made up by the end of the ninth week of the following semester will be automatically changed to an F if the agreed upon work, as stipulated on the written form signed by the instructor and the student when the I grade is awarded, is not completed.

Instructor Withdrawals

Students who have missed four consecutive classes (or the equivalent) not submitted any assignments nor taken any quizzes by the 45th day census report, due on **October 8, 2020**, are assumed NOT to be participating in the class and may be withdrawn at the faculty member's discretion. [faculty members should be clear in their withdraw policy, if you do not withdraw students please note in appropriate sections].

Student Withdrawals

Students may withdraw from class at any time during the first 2/3 of the semester without instructor permission and without incurring any grade penalty. Please be sure to withdraw yourself by **November 9, 2020**, if you do not expect to complete the class, otherwise you may receive an "F" grade.

Special Withdrawals (Y) Grade

The "Y" grade is an administrative withdrawal given at the instructor's option when no other grade is deemed appropriate. Your instructor must file a form stating the specific rationale for awarding this grade. "Y" grades are discouraged since they often affect students negatively. Your instructor will not award a "Y" grade without a strong reason.

Academic Integrity

Violations of scholastic ethics are considered serious offenses by Tohono O’odham Community College, the Student Services Department, and by your instructor. Students may consult the TOCC Student Handbook sections on student code of conduct, on scholastic ethics and on the grade appeal procedure. Copies are available at Tohono O’odham Community College.

All work done for this class must be your own, or the original work of your group. While you may discuss assignments with other class members, the final written project must clearly be original. You may use work from books and other materials if it is properly cited. Copying from a book without proper reference or from a person under any circumstances will result in an “F” for the assignment, and at the instructor’s discretion, possibly an “F” for the course. If you are uncertain about proper citations, ask your instructor or the librarian.

Course Feedback

All assignments will be graded and returned to the students promptly, typically within a week after the assignment is closed for handing in. Email and phone messages will be returned within two days. A student or the instructor may request a student conference at any time during the semester. Quarterly grade reports will be provided to each student, either in person, by email or via the electronic system of Canvas.

Class Participation

Class participation and preparation is essential to student success. Students are expected to come to class prepared and complete any preliminary work required as per the course schedule.

Students creating disturbances that interfere with the conduct of the class or the learning of others will be asked to leave. Student behavior guidelines are detailed in the Student Handbook under the Student Code of Conduct Violations (page 34).

Equal Access Statement/Disability Accommodations

Tohono O’odham Community College seeks to provide reasonable accommodations for qualified individuals with disabilities. The College will comply with all applicable regulations, and guidelines with respect to providing reasonable accommodations as required to ensure an equal educational opportunity. This process includes self-identifying as a student with a disability, providing supporting documentation of their disability, and being approved for services through the Disability Resources Office (DRO). It is the student's responsibility to make known to their instructor(s) the student’s specific needs within the context of each class in order to receive appropriate accommodations. We will work together in order to develop an accommodation plan specifically designed to meet the individual student's requirements.

For more information or to request academic accommodations, please contact: Anthony Osborn, TOCC Disabilities Resource Coordinator, aosborn@tocc.edu, or 520-383-0033 for additional information and assistance.

Title IX

Tohono O'odham Community College encourages each student to have the knowledge and skills to be an active bystander who intervenes when anyone is observed or being harassed or endangered by sexual violence. Sexual discrimination and sexual violence can undermine students' academic success and quality of life on campus and beyond. We encourage students who have experienced or witnessed any form of sexual misconduct to talk about their experience and seek the support they need.

Confidential support and academic advocacy can be found with: Student Services Title IX Coordinator/Counselor, Alberta Espinoza, M.Ed. located in I-We:mta Ki: Room 18. Phone 520-383-0033. Email: aespinoza@tocc.edu.

Conduct: Bias, Bullying, Discrimination and Harassment

Tohono O'odham Community College faculty and staff are dedicated to creating a safe and supportive campus environment as a core value. Harassment based on age, class, color, culture, disability and ability, ethnicity, gender, gender identity and expression, immigration status, marital status, political ideology, race, religion/spirituality, sex, sexual orientation, and tribal sovereign status will not be tolerated.

Instructor Policies and Expectations

Course Policies:

1. Students are expected to attend each class., arriving on time, except in the case of an excused emergency.
2. Students are expected to contact instructor prior to absences, coming late to class or leaving early.
3. Unexcused late arrivals or early departures will count against attendance record.
4. Class participation and preparation are essential to student success. Students must read textual material, prepare for projects, complete required research as stated on the course schedule.
5. Students are expected to come to class prepared for class and having done any preliminary work required as per the course schedule.
6. Students are expected to stay in class and work diligently throughout the whole time. Sleeping, frequent/continued exiting from the class during the class period will constitute one (1) absence.
7. No cell phone use is allowed during class. unless the instructor is allowing students to use their tools (calculator, internet access).
8. Late work is marked down 10 points for each day of tardiness.

9. Failure to submit a project results in a grade of zero (0). A 60% grade is a better grade!
10. No work accepted after the last class
11. At the instructor's discretion, extra credit opportunities and optional activities may be provided.

Classroom Behavior

- Students creating disturbances that interfere with the conduct of the class or the learning of others will be asked to leave.
- Student behavior is also detailed in student handbook under Student Code of Conduct Violations.

Late Work

- If you are not able to submit an assignment (other than quizzes) due to an emergency or hardship, please let me know prior to the deadline so arrangements can be made.
- Weekly Quizzes will not be reopened after their weekly due date. Please plan your attempt(s) accordingly.
- Lab Activities/Reports can be submitted up to a week after the due date. However, for every day after the due date, a 10% penalty will be deducted. After the week is over, lab report submissions will be marked zero.
- Presentations: Unless you have contacted me prior to the due date, a 10% penalty will be deducted daily for late submissions.

Exams

- Exams will be timed and open for a set amount of time.
- If you plan to be absent, please let me know as soon as possible. A missed exam with no communication prior or up to 4 hours before the exam will be marked 0.
- Make-up exams must be taken with 2 days of the original exam date.

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Courses Schedule and Important Dates

WK	DATES	TOPIC
1	8/24-8/30	Introduction to the syllabus, texts, course goals
	<i>Fri. 8/28</i>	<i>Last day to add/drop without instructor's signature</i>
	<i>Fri. 9/4</i>	<i>Last day to add/drop with instructor's signature</i>
2	8/31-9/7	Native Science & Western Science

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	<i>Mon. 9/7</i>	<i>Labor Day – College Closed</i>
3	9/8-9/13	Creation's Original Instructions/Inuit Perspectives on Climate Change
	9/14-9/20	Introduction to Weather & Climate
4	<i>Tue. 9/15</i>	<i>Last day to drop with a full refund</i>
	<i>Fri. 9/18</i>	<i>Week 4 Progress Report</i>
5	9/21-9/27	Introduction to Energy and the Sun
	<i>Fri. 9/25</i>	<i>O'odham Tas – College Closed</i>
Fall Break	<i>9/28-10/4</i>	<i>Fall Break – No Classes</i>
	<i>Fri. 10/2</i>	<i>St. Francis Day – College Closed</i>
6	10/5-10/11	Character of the Earth's Atmosphere
	<i>Thu. 10/8</i>	<i>45th Day Census</i>
7	10/12-10/18	The Hydrologic Cycle
	<i>Fri. 10/16</i>	<i>Week 8 Progress Report</i>
8	10/19-10/25	The Carbon Cycle & Greenhouse Effect
9	10/26-11/1	Biome/Climate Regions of North America
10	11/2-11/8	SW Climate change impacts and solutions: Climate Change, Water and TEK
	11/9-11/15	Climate change impacts on Western Forests
11	<i>Mon. 11/9</i>	<i>Withdrawal Deadline</i>
	<i>Wed. 11/11</i>	<i>Veteran's Day – College Closed</i>
	<i>Fri. 11/13</i>	<i>Week 12 Progress Report</i>
12	11/16-11/22	Climate Change Impacts on Animals: habitat, species distribution, biodiversity Controversy Paper due
13	11/23-29	Climate Change Impacts on Oceans: chemistry, global circulation, rising sea levels CR Presentations Due
	<i>11/26-11/27</i>	<i>Thanksgiving Holiday – College Closed</i>
14	11/30-12/6	Indigenous Frameworks for Assessing and Responding to Climate Change Responses to Climate Change: Politics and Social Action
15	12/7-12/10	Sustainability and Adaptation: Renewable Energy & Agriculture Responses to Climate Change: Human Health A Call to Action: Group Community-based Adaptation Plan and Presentations due

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